ART. Choke

A/D, I, 64, 1

DRAFT
27 February 1952

11

224 pages

MEMORANDUM FOR: THE RECORD

SUBJECT: B+C Contact with

1. Under cover of being a consultant to visits were made to on 11 and 12 February 1952. The arrangements for the meeting were made by B+C

2. C (Crude curare, a dried extract of certain South American plants, has been used as an arrow poison by South American natives for many years.)

C (The pure material produces paralysis of voluntary muscles, which makes it a useful adjunct to anesthesia in surgery.)

B+C

3. Curare had a very limited usefulness in medicine before the advent of pure d-tubocurarine chloride because the available products contained impurities which made the results from the use of the drug rather unpredictable. The form of the drug now available apparently produces essentially predictable results. Small doses of d-tubocurarine chloride produces relaxation of the skeletal muscles. Larger amounts produces paralysis without producing anesthesia or effecting the central nervous system. Death comes from a paralysis of the muscles which control breathing (asphyxia). The alkaloid is usually injected as an aqueous solution; it is effective in 12 to 15 seconds if injected intravenously, in 8 to 12 minutes if injected intramuscularly. If introduced into the body by another procedure it is effective in 3 to 5 minutes. C (, but my guess is that he was referring to administration as an aerosol.) It is not particularly effective if taken orally.

4. RESEARCH

b. RESEARCH PROPOSALS FOR MEDICAL APPLICATIONS

D-tubocurarine chloride in aqueous solution acts very rapidly, but the effect also decreases at a rapid rate. The rapid initial action is often desirable for medical uses, but the short period of effective activity is often a serious difficulty. In order to overcome this difficulty, preparations of the alkaloid have been made by incorporating it in a slow absorption base capable of delivering a clinically effective dose at a constant rate over an extended period of time. A product prepared by _____ is incorporated in a base consisting of peanut oil, cycholesteral derivatives, and beeswax; this is sold by Endo under the trade name "Tubedil". Similar products are sold by Squibb (containing oil and myricin) and Abbott (containing oil and wax). This material is of value in the treatment of traumatic injuries because a good deal of the pain and disability in many cases are due to muscle spasm. This can be controlled over long periods (12 to 24 hours with one injection) without the use of narcotics. The disadvantage of these preparations is that they must be warmed before use to obtain a homogeneous preparation and it must be handled by a person experienced in giving injections.

a. Long-acting Curare Preparation for Self-administration

A long-acting curare preparation which could be readily self-administered (adaptable to use in arpens, for instance) or administered by trained or untrained individuals would be of great value in the immediate relief of pain and disability arising from injuries to troops or civilians during war-time conditions. In many cases a disabled person could be returned to immediate effectiveness, in others the extent of disability could be materially reduced.

_____ feels his experience and facilities well qualify him to develop a curare preparation suitable for this purpose; he feels he can prove or disprove the feasibility of his ideas within about four months. He would like to obtain a research contract to develop a preparation with these specifications: (1)) Has an immediate curare effect; (2) Has a prolonged curare effect; (3) Can be used in arpen type equipment; (4) Does not require preliminary heating or other preparation; (5) Produces standard predictable results. He wants to produce several products, using different (curare-type) compounds and various formulations and subject them to preliminary animal experimentation. He can arrange for further animal experimentation and clinical tests on they can be done anywhere the may desire.

b. Curare Preparation for Field Nerve Gas Protection

_____ believes he can produce a curare formulation which would be immediate-acting, can be self-administered (for instance, arpens), and which will be far superior to Nerve Gas Field Protection now available. This would be a different product

from

from (a) above, and he has tried his ideas with anti-curaries. He would like to have a research contract to develop his ideas. He proposes to prepare the formulations; animal and clinical testing would be up to

e. Remarks

(1) The above ideas were offered without being solicited or prompted by me. I was careful to try to neither verify nor deny any ideas he had which touched on classified interests; no classified information was knowingly volunteered by me to

(2) said the $20,000 to $25,000 estimate be made to for a research project referred to a and b, above. The amount was given on the spur of the moment and does not represent a considered estimate. If the expresses an interest, he will submit a more considered estimate and break the figures down to individual items.

(3) If he gets a contract from he intends to obtain the services of . (Later he said will probably become associated with him whether he gets a contract or not.)

(4) mentioned those men as being acquainted with his work and the general field:

5. IDEAS ON OUTLET USE

The following ideas on export uses for curare were obtained during the discussions with :

a. Partially purified curare is used successfully by South American natives to kill game and enemies. The material is put on the tip of spears or blow darts and it produces an almost immediate paralysis of the victim. described native methods and results and showed specimens of the equipment

b. in 1941 concerning possible Military uses for curare alkaloids. At that time there was interest because the Germans seemed to be quite interested in crude curare. It was found that very finely divided crude curare (preferably of the strychnos type) plus a nasal irritant had an almost immediate paralyzing effect when released as an aerosol or powder. He felt the main difficulty with curare

for

for Military use was the rarity of the material (this would be no disadvantage for covert use). There are many water soluble phytotoxins with powerful physiological properties in crude curare, and the nasal irritant greatly increased the rate of absorption of the toxic material.

c. The situation has rapidly changed since 1941, so that now far more potent agents can be obtained from crude curare. The crude material contains tenziferous compounds for Military (covert) use would be comparatively difficult because of the time and work it would take to extract, identify, and test individual tenziferous compounds.

d. Partially purified crude curare would be easy to obtain and have possibilities for Military (covert) uses. It is more potent than pure d-tubocurarine chloride. It has both the d-tubocurarine chloride properties and what are usually considered undesirable side effects for curare used in medicine. These additional effects involve histamine-like reactions. This material plus a nasal irritant should have an immediate powerful effect in small amounts, when released as an aerosol or powder. It would be very effective if introduced within the body by a dart, etc. It has little or no effect if it gets into a small break in the skin or if taken orally.

C e. _____ apparently is primarily interested in the defensive use of curare, but he said he would very willingly cooperate in any way he could in anything involving the defensive or offensive use of curare alkaloids.

5. ACTION:

B a. Pass the information in paragraph 3 along to _____ for whatever action they feel desirable.

C b. Obtain a TOP SECRET security clearance for _____ and pursue the potential covert uses of curare alkaloids further.

H _____

Research & Development

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which are extremely toxic. However, developing toxiferene compounds.

C A/B, I, C4, Z

A

DRAFT-
9 February 1952

MEMORANDUM FOR: THE RECORD

SUBJECT: C Initial Contact with _____

C 1. On this day, the writer contacted _____

A The contact was made through _____ 00 field station. _____ accredited me to _____ as a CIA representative A+C and then left _____ and the writer alone. C

2. _____ the constrictor substance, benzedrine, and other similar drugs.

C+D

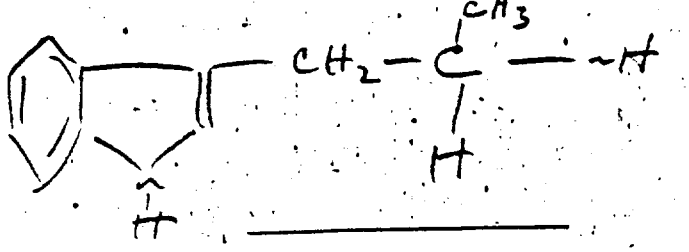
C 3. _____ central nervous system depressants and stimulants, both in their peripheral and central manifestations.

C _____ to conduct active research where facilities and competence could be effective. _____ of any new substances or other matters of interest to us in the general field of chemical materials that might be of use to us.

C 4. _____ it is the writer's feeling that small, very sensitive problems could be very securely carried out

5. The following specific facts were brought out in our discussion:

C a. Indole analogue of benzedrine - _____ mentioned a very interesting substance which they ran across in their benzedrine researches. It is the indole analogue of benzedrine.



_____

When given at a dosage of 50 mg orally this compound gives the subject a profound depression - just the opposite of euphoria. It apparently gives a deep-seated depression of the central nervous system which extends into the mental sphere of mood and alertness. They didn't look into this any further because it produced this very undesirable reaction. _____ thinks that many indole derivatives should be studied for this type of activity.

b. LSD - The discussion touched on LSD only insofar as _____ inquired as to whether anyone was looking into indole derivatives as structural analogues of LSD. He thought this field should be studied intensively in order to find compounds much simpler than LSD in structure that have the same kind of activity. He suggested that we find out what _____ has done in indole compounds.

c. Methylene dioxy benzedrine - _____ has answered the fact that the methylene dioxy analogue of benzedrine produces hallucinations mental images and mental confusion in doses of 100 mg taken orally. Their studies on visual imagery and knee-jerk reflex indicate profound CNS effect for this type of compound.

d. Quaternary Salts - They discovered that the hexadecyl tributyl ammonium ion has very high toxicity administered intravenously in gamma quantities.

e. Capsaicin - _____ in connection with researches "denaturing benzedrine inhales", found that capsaicin, the active principle of red pepper, and some simpler synthetic analogues were very effective in producing a harmless burning sensation on contact in extremely low concentrations.

f. Marijuana - _____ indicated that a more or less comprehensive piece of research had been done during the last War at the _____ under _____ on the efficicy of Marijuana for eliciting information. _____ didn't know any of the details.

6. _____ indicated that the person in this country that he thinks is most highly qualified in the field of pharmacopsychology along the lines in which we are interested is _____

6. _____ indicated that he would be willing to fill out a PEB form if we so desired.

_____
_____ Chemical Branch
Research & Development

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11 February 1952

MEMORANDUM FOR: THE RECORD

SUBJECT: Contact with [redacted]

1. This day the writer briefed [redacted] on certain research interests and needs of HDD. A detailed tour of the [redacted] was also made later in the day. [redacted], aside from the potential involved in his own scientific acumen and in those of his [redacted] is obviously in itimate touch with practically all the chemical and pharmaceutical manufacturers on the [redacted]. He makes trips to Washington frequently and has agreed to call the writer when he is in town.

2. The contact with [redacted] was made through [redacted] of the [redacted] CO field station who introduced the writer as a CIA representative and then left.

3. [redacted] have a technical staff of about [redacted] professional chemists, biochemists and engineers, and are currently actively engaged in research in the following fields:

[redacted]

4. The physical facilities of the laboratory seem to be adequate to do effective work in these fields and the personnel that the writer contacted seemed well trained and enthusiastic.

5. [redacted]

5. [redacted] indicated that he would be glad to originate or facilitate procurement of small orders of specialty chemicals where this would be of assistance to us.

6. It is the writer's opinion that [redacted] facilities could be of considerable use to us in the following ways:

a. To handle small problems in applied chemical and biochemical research.

b. To help procure small amounts of sensitive or difficultly obtainable chemicals.

c. To keep us advised of chemical research activities in our fields of interest on the [redacted]

7. [redacted] will be happy to fill out a MIS.

[redacted]
Chemical Branch
Research & Development

Distribution:
Addressee - Orig.
TSO - 1
CD Surname

[redacted]

7 February 1952

MEMORANDUM FOR: THE RECORD

SUBJECT: Contact with

1. Under cover of being a consultant to [redacted] was contacted to discuss the technical aspects of the dog loser problem. In general [redacted] proved to be an exceedingly competent scientist, combining a brilliant, incesive intellect with versatile interest in all phases of human psychology.

2. [redacted] disqualified himself and his department from any work on sensory perception in dogs, pointing out that they had not a great deal of specific experience with dogs as subjects, nor did they have people strong in the chemical and "gadgeteering" disciplines necessary for this kind of work. A detailed discussion of the dog problem indicated that [redacted] felt very strongly that the basic part of the research should be handled by a research psychologist, strong in comparative animal psychology and with a good background in the disciplines mentioned above. He suggested the following as some likely candidates:

[redacted]

3. Entirely unsolicited, [redacted] mentioned some ESP work in dogs recently reported in the Journal of Parapsychology. This led to a general discussion by him of ESP, [redacted] work and very recent British

[redacted]

British work in this field. The writer evinced no interest in this, but it was obvious that _____ was vitally interested in this subject, and his discussion of the subject revealed the following points:

a. _____ thinks that ESP is well proven, and they are starting work in this field at _____ The main difficulty is in providing "hot" subjects. None have been uncovered yet.

b. The British work is much better than the Duke work to date. It is more imaginative and the experiments are much better laid out.

c. _____ himself is too wrapped up in trying to prove a theological point to be a completely effective experimenter.

d. Much experimental work can be done in this field.

e. The _____ is interested in getting financial support for such work.

f. Should we desire, _____ indicated a willingness to fill out PHS forms. The writer thinks _____ would be an excellent addition to NRD's group of consultants, since we have no one cleared at the consultant level who is thoroughly competent to discuss various psychological problems.

_____

_____, Chemical Branch
Research & Development

Distribution:
Addressee - Orig.
TSS - 1
CB Chrono

A/B E 64 15

DRAFT

7 February 1952

MEMORANDUM FOR: THE RECORD

SUBJECT: Discussion held with [redacted] B+C

1. On this date, the writer contacted [redacted] on the basis of an appointment made by [redacted] OSI. The purpose of the visit was to get [redacted] critical appraisal of the contemplated research program on various chemicals for use in covert warfare.

2. In a discussion of the production of retrograde amnesias by chemical means, [redacted] dwelt at some length on two physical techniques which he had previously discussed with [redacted].

a. Electrorbock - [redacted] believes that electroshock, repeated three or four times in the space of one hour, should produce a high degree of retrograde amnesia. He said it would be almost impossible for them to test this experimentally at [redacted], because of the severity of the treatment to the patient.

b. "Icepick Operation" Use electroshock to produce anesthesia, a Washington surgeon has many times successfully performed an operation involving piercing the brain just over the eye with a fine surgical "icepick" and destroying certain frontal brain tissue, with nervous confusional and amnesia effects. This operation leaves no marks on the skin.

3. The possibilities of using Et_2Zn, privine, metrazole, high O_2 tensions, anti-vitamins, Be, and LSD was discussed with [redacted]. He thought they all offered some promise, but would place high O_2 tensions and anti-vitamins at the bottom of the list. He thought that research to answer our specific questions on each of these substances was needed, particularly in the case of LSD. He was asked if any of the work he was aware of could answer our needs. His opinion was that experimental work specifically designed to our operational needs would provide the answers.

4. [redacted] mentioned the Hypospray Injector and was pleased to hear that we were working on it. He gave the writer some interesting literature on amnesia.

[redacted]
Chemical Branch
Research & Development

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A/15, I, 64, 6

DRAFT A
6 February 1952

MEMORANDUM FOR: THE RECORD

SUBJECT: Contact with

C+B

1. Under cover of being a consultant to the a visit was made to of the has been research director of the hospital for about a year having last been author of the important text recently published

B

C

B

3. The current research effort at is being directed along the following three lines, with many prospects in the planning stage:

a. High Oxygen Tensions -

B+C

a research proposal entailing to study the effect of high oxygen tensions in normal and psychotic patients. (In all research at , normal controls are available from volunteers and the hospital staff). If the content of oxygen in a preparatory gas mixture is raised from the normal 20% to 50%, mental confusional effects become apparent in both normal and psychotic patients. The interest in this arises from the fact that practically all of the elderly psychotic patients have cerebral arterial sclerosis, which means that the brain is not getting enough oxygen. This is a relatively uncharted field, with obvious implications for our requirements.

b. Glutamic Acid - It is known that giving repeated doses of glutamic acid acts as a slow continuous stimulant to the adrenal medulla, which produces a constant slight excess of adrenalin in the blood, producing a peculiar type of hyperactivity, with a stage of mental confusion. _____ is interested in a very comprehensive experiment to pin down the parameters of this effect in normal and psychotic patients.

c. Atropine Substitutes - Atropine, with its effect on acetyl choline esterase is of great interest in several forms of mental disease. Acetyl choline is the mediator for the nervous system and _____ in his work on G-gases, _____ for developing atropine as the effective protective agent. In mental diseases like Parkinson's Disease and epilepsy, atropine like compounds with a minimal peripheral effect and maximum central effect are needed. Extensive research is being undertaken at the Hospital to uncover such compounds.

4. Other points brought up in a general discussion of our requirements were:

a. Vitamin B_1 Deficiencies - Since the brain can use only carbohydrate for energy, and since the metabolism of Krebs cycle, B_1 deficiencies have functional brain disturbances. Acute B_1 avitaminosis actually causes permanent degenerative brain damage. This would seem to open the possibility of using thiamine antagonists to produce confusional and other mental states.

b. Listlessness - _____ thinks that a rational approach to our urgent operational requirement for a chemical producing a general listlessness and lethargy might be in a compound which produces a general avitaminosis. He pointed out that the general lethargy and lack of productiveness of the very low income groups, in the southeastern U. S. is due to avitaminosis for vitamins B_1, B_2, C and nicotinic acid.

5. _____ indicated a desire to help in any way possible, urged us to consult further with him, and indicated his willingness to fill out a PES form. He also promised to send us a copy of his research proposal to the _____

_____
Chemical Branch
Research & Development

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A/B, F, C4, 7

DRAFT.
27 February 1952

A

MEMORANDUM FOR: THE RECORD

SUBJECT: C+D Contact with

C+D 1.

C+D was contacted 4 February 1952, as a consultant to ____ of the ____. His interests include drug addiction, drug tolerance, analgesia, anesthesia, respiratory physiology, and pharmacology of the central nervous system.

C 2. ____ discussed chemicals which have been found to temporarily inactivate or permanently destroy specific portions of the nervous system. Keto bemidon is one such drug. It is used in Europe to some extent in the treatment of drug addicts. C ____ has found that if monkeys are given one large sub-lethal injection of keto bemidon (0.18 mg./kg.) they become completely helpless. Post mortem examination of the brain shows that the white matter has been destroyed while there has been no apparent effect on the gray matter. Numerous smaller doses of the drug has no such effect on monkeys. C ____ said he has tried this only on monkeys; hence it may be species specific. Kibentil is a related compound with effects which suggest a similar action. These compounds are ordinarily introduced by injection, although they would probably be effective if administered as an aerosol. 8-amino quinolines will destroy specific centers of the brain. He suggested investigating compounds which have been tested for anti-malarial activity in order to find more about compounds which effect specific portions of the nervous system. He mentioned ____ in this connection. C+D ____ is now writing a monograph on anti-malarial compounds.

3. If monkeys are exposed to heavy and repeated doses of ethylene oxide they lose the function of their spinal chord, but the normal function returns after removal from the gas. Accidental human poisonings have indicated a similar effect from ethylene oxide. The concentration of chemical required make it out of the question for covert activities, but the results are suggestive.

C 4. ____ said they have recently received some material called ryanodine from Merck. He was not certain about its chemical composition, but it is made from a Mexican plant and is used as an

insecticide

insecticide or rodenticide (he wasn't sure which) in South America. If 100 micrograms/kg are given orally to a dog it produces muscular spasms of long duration. The spasms begin fairly immediately. This material is being investigated in _____ at the present time.

5. _____ are also working on methadols. Some of these compounds produce an extended (36 to 48-hours) loss of consciousness and reversible paralysis. In monkeys there is no apparent effect from the compounds until a couple of hours or so after the drug is given. This group of compounds should be screened. _____ said that _____ has worked on some of the clinical aspects of the methadols, but he has had some difficulties, so it is not certain whether he will continue this line of investigation. _____ was mentioned as another possibility for work on methadols. _____ felt that histo chemical studies would yield results in this field.

6. In the field of chemicals which produce mental derangement, he doubted that anything would be found superior to LSD. He doubts that reserpine will prove of much value. He questions the value of cannibinol compounds, but mentioned _____ in this field. He said that muscharin intoxication is probably due to muscarine, and that prostigmine would probably give similar results.

7. _____ mentioned if methyl bromide would be of value in guerrilla type warfare. He pointed out it is an odorless gas and is quite potent.

8. _____ would be happy to do work for us in his specific fields of interest. He is interested primarily in animal work and is not equipped to synthesize complex chemicals. Since _____ at present has a contract with _____, nothing specific will be discussed in regard to work until it can be determined that it can be done without running into competition with the _____.

_____

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A/B, I, 6, 4, 8

DRAFT
21 February 1952

MEMORANDUM FOR: THE RECORD

SUBJECT: Interview with

was contacted on the evening of 5 February 1952.

2. was approached under the cover of a consultant to appeared to be very security conscious. He expressed his continuing concern about security and asked to see the writers identification.

4. appeared to have an unusual degree of knowledge and interest in chemistry, in the general field under discussion are inhibitors of glucose combustion and acetyl choline esterase inhibitors.

5. said that thiaminase had been suggested as a glucose combustion inhibitor. (Review: Tudkin, Physiol. Rev., 29, 389 (1949)). However it is improbable that thiaminase could be developed into a good covert weapon. Since it is a protein it is ineffective if given by mouth; it must be injected or inhaled. felt that the amount required to effect a person with adequate diet would be rather large for optimism value as a covert weapon. Anti-thiamin compounds were discussed, but they do not seem to be too promising as covert weapons because of the comparatively large amounts which would probably be required to produce a noticeable effect on an individual with an adequate diet.

6. mentioned radioactive ascorbic acid. This appears to have possibilities as a covert weapon. It may be effectively given by mouth, injection, or inhaled, and it tends to be concentrated in glandular tissue. indicated that a very small amount of the material

material would produce destruction of the adrenal cortex. Even a slight damage to the adrenal cortex would produce symptoms characteristic of Addisons disease-disturbances in sodium and potassium metabolism and in glucose metabolism. Severe Addisons disease, if not properly treated, will result in death. Since Addisons disease is not well understood and radioactive sucrose acid would be comparatively easy to disseminate, it is felt this possibility should be further investigated.

C. _____ gave the names of several individuals who are active in this general field.

D. _____

C. 7. _____ felt that sedatives such as barbiturates are about as good as anything he knows as interrogation aids. He thought alcohol was about as good. He felt choline esterase inhibitors should be investigated as antipolygraph aids.

8. He said various shock treatments are effective in producing amnesia. Insulin shock is not effective. Metrotol shock is effective, but it is a sloppy method when used in actual practice. Proper dose, rate of injection, etc. are difficult to determine for the production of a given effect. He thought that several repeated electric shock treatments given in one day was the most satisfactory procedure. Under proper conditions this will produce temporary amnesia lasting for a couple of weeks.

C. He said the Japanese used ordinary 110 volt alternating current in psychiatric practice during the war with apparently satisfactory results. He said alternating current produces more confusion than does rectified alternating current, and a square wave rectified current produces the least confusion. There is a discussion of this in a recent issue of the Bulletin of Mathematical Biophysics.

C D+B 9. _____ mentioned an advertisement he had sent to _____ about a polysaccharide or protein sold under the trade name "Tyrosan". A dose of 1 or 2 _____ gives a fever of less than a degree, but a ten-fold increase in dose would

produce

produce a definite elevation in body temperature. Although the chemical nature of this material would indicate it would not be effective if given orally, it should be effective as an aerosol.

10. Actions: Further investigation of possibilities of radioactive ascorbic acid, use of shock treatment to produce amnesia, and of "Pyroman".

A

Chemical Branch
Research & Development

DRAFT

4 February 1952

MEMORANDUM FOR: THE RECORD

SUBJECT: Initial contact with

1. This date the writer contacted under the cover of being a consultant to on a special project for the covert use of chemicals.

2. An extensive inspection of the laboratory facilities under immediate control indicated the following things:

b. Excellent facilities exist for any type of medical research involving physiologically active chemical compounds. Human subjects would be available for work that could be carried out as legitimate medical research. Extensive animal facilities exist for other kinds of research.

c. Contractual arrangements via the method would be very feasible. indicated that it would be necessary for only one other person to know what he was doing and he therefore suggested that be cleared for this sort of work. He indicated that both he and would be happy to fill out PEJ forms.

d. Current work in the laboratory is centered mainly around sterilization of blood by chemical agents to destroy virus and spore bodies.

bodies. An extensive program of organic chemical research supports this work. An active interest in many medical-clinical research problems exists, but _____ and other people seem to be very well up on the current status of research in chemical medium.

C

c. _____ is in constant close contact with clinicians, surgeons, psychiatrists in his capacity as _____ to them and will keep us informed of any matters in the medical field of interest to us.

C

3. _____ mentioned two specific current items which he thought should be of interest to us:

B+D

b. Beryllium - There's a considerable literature, most of it stemming from recent accidents involving broken fluorescent lighting equipment on the extreme toxicity of beryllium. This is certainly the most toxic inorganic element and it produces a peculiar fibrotic tumor at the site of local application. The amount necessary to produce these local tumors is a few micrograms. _____ suggests a study of the effect of inhaling small amounts of beryllium in the lungs, and other studies to evaluate the potentialities of beryllium as a covert weapon.

C

C

b. _____ thought his _____ could do an effective job of studying anti-LSD agents by finding one or more objective syndromes of LSD application in laboratory animals and screening compounds that might combat its action. He was invited by the writer to develop this into a research proposal if he so desired. It was emphasized that no commitment of any kind was involved in our acceptance of a research proposal.

5. The follow-up actions indicated by the above discussions are:

C

a. Send PEB form to _____ for himself and _____

B

b. Start efforts to get information on highly active processes substances from _____

c. Start preliminary investigation on potentialities of beryllium

_____

Chemical Branch
Research & Development

[illegible]

[illegible]
25 February 1953

[illegible]

SUBJECT: Discussion with

C+D

C+D 1. [illegible] was contacted on 5 February 1953. The contact with [illegible] was made with the assistance of [illegible] and the undersigned approached [illegible] as a representative of [illegible]. The discussions with [illegible] was limited to the subject of curare-like agents. [illegible] a colleague of [illegible] who is interested in toxic curare compounds and artificial respiration, was not available because of illness.

C 2. Crude curare is obtained by brewing roots, bark, etc., of several species of South American plants. It contains powerful alkaloids and is used by certain South American tribes as an arrow poison. An individual or animal struck by such a poisoned arrow is rapidly rendered helpless due to paralysis of the skeletal muscles. Purified curare and chemicals having a curare-like action are used to some extent in medicine, when it is desired to produce a relaxation of the skeletal muscles without the production of anesthesia or the production of central nervous system paralysis.

C 3. [illegible] said that a large number of curare-like chemicals (acetyl choline blocking agents) have been prepared and screened by pharmaceutical houses such as Merck and Dohme, Burroughs Welcome Co., Eli Lilly, Abbott, etc. A few substances which meet Medical requirements are now on the market, but he said many which would more nearly meet our requirements have been discarded. He said that if we wrote down the desired specifications for a drug with curare-like action, and then canvassed the drug houses, we would undoubtedly find that a drug which meets the specifications has been screened. This might be a rather optimistic statement, but since a potent curare-like agent would be of value in covert activities, an effort should be made to see what can be obtained by this method.

4. Several investigators mentioned who are active in synthesizing or testing compounds of the curare type: D. Bovet, H. J. De Beer, J. C. Hoppe, A. R. McIntyre, W. B. M. Paton, H. H. Sovringhaus. The work of these and other men is described in the book "Curare and Anti-Curare Agents" published by the New York Academy of Science.

5. _____ expressed an interest in clinical testing of curare-like compounds, but not at the

6. Action:

a. Obtain information about curare-like compounds which have been screened by pharmaceutical houses.

_____

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